Jed T430/T440 Projector Controller user's manual version V107F part B

(Ed Schoell rev Sept 21st 2015 … Flat panel only code version.)

Table of Contents

AHA LCD	1	Panasonic LCD panels	15	Sharp	23
BenQ LCD	3	Panasonic Plasma panels	16	Mitsubishi with Sharp codes	31
CommBox LCD monitor	4	Plasma LCD TV (IR)	17	Sharp LCD via LAN	32
LG LCD/Plasma TV	5	Philips BDL LCD/LED panels	18	Smart LCD	33
Mitsubishi LCD	9	Pioneer Plasma panels	20	Sony LCD	34
NEC LCD TV & Sherwood Plas.	10	Samsung Plasma/LCD panels	21	2-Touch/CTOUCH	38

Setting T440 system to control "Flat Panel" devices.

This release (and future releases) now combine projector (-F) and flat panel (-P) codes into one release with just a version number (greater than V100) and no F or P letters. (-P and –F manuals will still be separate documents.)

The selection which runs is set by flag "F". This flag is normally cleared ("0") when a unit is shipped from JED as a "Projector" device, and is set to "1" for "Flat panel" devices.

WHEN A UNIT IS RE-LOADED WITH A NEW HEX FILE, THE T440 FLAG "F" IS RESET TO "0", IE TO A "PROJECTOR" FLAG SETTING.

The procedure for setting flags is described in the Part A manual, Page 16. In summary:

- To set the T440 for **projector** control, set DF on the rotary switches SW2 and SW3 (addressing flag "F"), and switch off all the option switches. A green LED blinks for 2 seconds;
- To set the T440 for **flat panel** control, set DF on the rotary switches SW2 and SW3 (addressing flag "F"), and switch off all the option switches except OPT8 switch, which is to be On. A green LED blinks for 2 seconds.

Then push the small RESET switch on the back.

The device is now ready to be set to a code and option setting. Don't forget to press the RESET switch again.

AHA LCD touchscreen, 55", 65", 70", 75", 84": (Code 9C Hex)

Based on RS232 protocol supplied by importer, V1.05.

Channel codes are:

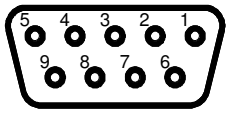
```
Input1   := 'kb 00 07';    //Computer1  RGB-PC
Input2   := 'kb 00 0a';    //Computer2  HDMI-2

Input3   := 'kb 00 0b';    //Video1 HDMI-3 HD
Input4   := 'kb 00 09';    //Video2 HDMI-1

Input5   := 'kb 00 0c';    // DisplayPort

Input6   := 'kb 00 0e';    // OPS On board PC

Input7   := 'kb 00 0d';    // USB  (Arrow keys needed on IR remote to access files on USB)

Input8   := 'kb 00 08';    // DVI-D
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making HDMI-1 the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

- On panel connection blink codes supported;
- Audio Mute is supported, but not Freeze.

RS232 connections to AHA LCD

These use a 9-pin-D9 female on the panel, male on cable. Communications is at 9600 baud 8N1.

Function/Direction	**T440 "projector" Connection**	**Sanyo "Control" Port Connector**	 D-sub 9 male solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T440 to projector	Tx	9-pin D-sub pin 3 (RXD)	
Reply data from projector to T440	Rx **	9-pin D-sub pin 2 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

** Note, the measured return voltage in rest state from the projector is only -0.9 volts, not the usual -5 to -9 volts. However the positive swing of voltage is OK.

BenQ LCD: RP550+, RP551+, RP650+, RP651+, RP700+, RP840G: (Code 4E hex)

RS232 codes have not been found on the net, but have been supplied directly by BenQ Australia.

Channel codes are:

```
Input1   := '801s' + 22h +'000' + 0Dh;     // Computer1 RGB 2: VGA analog-RGB
Input2   := '801s' + 22h +'002' + 0Dh;     // Computer2 HDMI 2

Input3   := '801s' + 22h +'003' + 0Dh;     // Video1 AV          * (OPT1 swaps Video1 & Video 2)
Input4   := '800s' + 22h +'001' + 0Dh;     // Video2 HDMI 1  * (OPT1 swaps Video1 & Video 2)
```

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

```
Input4   := '801s' + 22h +'005' + 0Dh;     //Video2 S-Video

Input5   := '800s' + 22h +'004' + 0Dh;     // YPbPr Component

Input6   := '800s' + 22h +'006' + 0Dh;     // DVI

Input7   := '800s' + 22h +'007' + 0Dh;     // DisplayPort
Input8   := '800s' + 22h +'008' + 0Dh;     // SDI
Input9   := '800s' + 22h +'009' + 0Dh;     // Multimedia

Input10  := '800s' + 22h +'010' + 0Dh;     // Network

Input11  := '800s' + 22h +'011' + 0Dh;     // USB Display
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

- On panel connection blink codes supported;
- Audio Mute is supported, but not Freeze.

It is necessary to set the following in the "Tools" menu (4th):

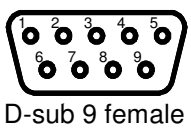
- Control setting -> RS232;
- Monitor ID -> 1;
- Power save -> Off

There is no volume level indication on the LCD image.

RS232 connections to BenQ LCD with D9 male on the LCD

The reply signal from the LCD screen is disabled between transmitted messages, so the usual test with a multimeter can give confusing results, as BOTH the LCD Rx (line into the Rx input) and Tx (reply line from the LCD) measure approximately zero volts and both show a DC resistance of about 5K to ground. The LCD Tx line only outputs a +/- 5 volts waveform when a message is replied to, and then goes back to zero.

These use a 9-pin-D9 male on the LCD, female on cable. Comms is at 9600 baud, 8 bits, Odd parity, 1 stop.

Function/Direction	**T440 "projector" Connection**	**"Serial" Port Connector**	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T440 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T440	Rx	9-pin D-sub pin 3 (TXD)	

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

CommBox LCD monitor with touchscreen interface

These screens are interfaced via an IR transmitter or a wired connection sending in an un-modulated pulse sequence identical to an IR transmission (but without the 38khz carrier) into a 3.5mm jack on the back (marked IR).

Code A2 Modulated IR to CommBox , requires an IR bug either sending IR from the front or via a hole in the rear.

Code A3 UnModulated IR-like pulses to CommBox via 3.5mm jack in back.

IR command codes:

```
Input1FunctionCode   := $0025;  // Computer1: VGA
Input2FunctionCode   := $0026;  // Computer2: DVI

Input3FunctionCode   := $0023;  // Video1: Composite
Input4FunctionCode   := $0027;  // Video2: HDMI 1

Input5FunctionCode   := $0028;  // HDMI 2

Input6FunctionCode   := $0022;  // Component

Input7FunctionCode   := $0024;  // S-Video
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the “Computer” channel and Video1 as the “Video” channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making HDMI 1the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

This can be used with a variety of keyboards:

- With a “Code 9” keyboard, with buttons selecting “Video” and ‘Computer;
- With “Code 0” or “Code 5” input-only select keyboards;
- With a “Code B-L” or “Code B-P” keyboard, with buttons selecting “Video” and “Computer1” and “Computer2” with Volume control keys;
- NO Panel connection blink codes and OPT7 handshake modes are available;
- No mute/freeze commands are provided; and
- Volume key presses send 5 consecutive Vol Up or Vol Down commands.

LG LCD/Plasma display/TV (Code 90, 91, 93, 94 & 97, 98, 99 and 9A hex)

In the back of each "Owner's manual" is a list of "input select" codes … examine this table to determine the family. If input select uses "kb" codes, select the codes 18 hex and 19 hex below.

If "xb" is shown, use the table on the next page for input select.

"kb" family input select codes

There are over a 100 different displays in the "kb" LG family, and **codes 90h TO XXX** cover the "kb" codes group (see the user manuals).

Group 1 Code 90 hex on the switches:

PC to "kb 00 0" for PLASMA monitor: MU-40PA15*, 42/50PM1M**, 42PM3MV**, MU-60PZ30***, MU-0PZ40***, MU-42/50PZ41V**, MU-42/50PZ44***, MU-42/50/60PZ90***

Function code	"kb" strings, code 90hex	Comments
Input1/Computer1	'kb 00 0' + 0D	RGB-PC
Input2/Computer2	'kb 00 4' + 0D	RGB-2 / DVI
Input3/Video1	'kb 00 2' + 0D	AV1 Video/S-Vid * OPT1 swaps Video1 &Video2
Input4/Video2	'kb 00 9' + 0D	HDMI-2* * OPT1 swaps Video1 &Video2
Input5	'kb 00 4' + 0D	Component 1 Video YPbPr
Input6	'kb 00 1' + 0D	Component 2 Video YPbPr
Input7	'kb 00 6' + 0D	RGB-DTV / Component
Input8	'kb 00 9' + 0D	HDMI-2 / DVI-PC

* T440: OPT6 switch ON will use S-Video in place of HDMI/DVI. T430: uses HDMI as Video2.

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

Group 2 Code 91 hex on the switches for Plasma Monitor/Digital TV:

PC to kb code 5 for PLASMA: MU-50PM10, MU-42PM11, MU-42PM12*, RU-42/50PX10, RU-42/50PX11, RU-42/50PX/20, MW-71PY10*, MW-71PY10**, RT-42/50PZ60/70***, R4U-42/50/60PZ61/71, MU-60PZ95*

Function code	"kb" strings, code 91hex	Comments
Input1/Computer1	'kb 00 5' + 0D	RGB-PC
Input2/Computer2	'kb 00 6' + 0D	DVI-DTV
Input3/Video1	'kb 00 1' + 0D	AV1 Video/S-Vid * OPT1 swaps Video1 &Video2
Input4/Video2	'kb 00 9' + 0D	HDMI * * OPT1 swaps Video1 &Video2
Input5	'kb 00 3' + 0D	Component 1 Video YPbPr
Input6	'kb 00 4' + 0D	Component 2 Video YPbPr
Input7	'kb 00 7' + 0D	Video 3
Input8	'kb 00 8' + 0D	Video 4
Input9	'kb 00 9' + 0D	HDMI
TV	'kb 00 0' + 0D	TV Digital
TV Channel Up	'mc 00 00' + 0D	Use IR command PR+ CH+
TV Channel Down	'mc 00 01' + 0D	Use IR command PR- CH-

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have

Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels.)

Group 3 Code 93 hex on the switches for Digital TV (or Monitor only), 94 hex on the switches for Analog TV:

PC to "kb 00 7" for LCD/PLASMA TV: 42LC2DR, 32/37/42LC7D*, PLASMA: 50PB2DR, 42/50/60PB4D, 42/50PC1***, 42/50PC5D*, 42/50/60PM4M/MA, 50PX1D***, 50PX2DC**, 42PX3D****, 42/50PX4D***, 42PX5D***, 50PX4DR, DU-50PX10*, DU-42PX12X*, *, 50/60PY2DR*, DU-42/50PZ60***, DU-42/50PZ70***

Choice of codes 93h (Monitor or Digital TV) or 94h (Analog TV) determines TV type.

Function code	"kb" strings, code 90hex	Comments
Input1/Computer1	'kb 00 7' + 0D	RGB-PC
Input2/Computer2	'kb 00 8' + 0D	HDMI-1 / DVI-DTV
Input3/Video1	'kb 00 1' + 0D	AV1 Video/S-Vid * OPT1 swaps Video1 &Video2
Input4/Video21	'kb 00 9' + 0D	HDMI * * OPT1 swaps Video1 &Video2
Input5	'kb 00 4' + 0D	Component 1 Video YPbPr
Input6	'kb 00 5' + 0D	Component 2 Video YPbPr
Input7	'kb 00 6' + 0D	RGB-DTV / Component
Input8	'kb 00 9' + 0D	HDMI-2 / DVI-PC
TV Channel Up	'mc 00 00' + 0D	Use IR command PR+ CH+
TV Channel Down	'mc 00 01' + 0D	Use IR command PR- CH-

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

```
TV := 'kb 00 0' + 0D;       // TV Digital (Code 93 hex selects)
TV := 'kb 00 1' + 0D;       // TV Analog (Code 94 hex selects)
```

Aspect Ratio settings See following for common aspect commands.

"xb" family input select codes

The newer "xb" family, with **codes 97h & 98h, 99h & 9Ah**, and use a two hex digit pair after the ASCII select string, with the top 4 bits (top digit)(5x, 6x, 9x, 2x, 4x) selecting an input type (AV, Component, etc) and the low 4 bits the input number (x0 or x1).

Choice between codes 97h or 98h (and between 99h or 9Ah) determines TV type, Analog or Digital. So 97h and 99h are Digital TV, and 98h and 9Ah are for Analog TV.

Note re Plasma TV models 42/50PQ10, 42/50PQ11**, 42/50PQ20**, 42/50PQ30**, 42/50PQ31, 42/50PQ60**, 50PS30**, 60PS40**, 50PS60** …** We have two manuals for these, one showing them as 'xb 00 **50**', i.e. Group 4 below, and showing them as 'xb 00 **60**', i.e. group 5 below. We suggest trying both drivers for one that works to select RGB.

Group 4: Codes 97h and 98h: (first column in table below) uses code 'xb 00 **50**' + 0D for RGB/VGA PC input used as "Computer1".**LCD:** 32/42/47/52LB9D**, 26/32/37/42LG3***, 32/42/47LG5***, 32/42/47/52LG6**, 42/47/52LG7***

PLASMA: 42/50PQ2***, 42/50PQ6***, 50PS3***, 60PS4***, 60PS6***, 42/50PB4D*, 50/60PY3D**

Group 5: Codes 99h and 9Ah: (second column in table below) uses code 'xb 00 **60**' + 0D for RGB/VGA PC input used as "Computer1". Typical models are: LCD: 32CL20, 32/42/47CL40, 42/47LB7RF*, 32/42/47/52LB9R*, 26LC2R*, 26/27/32/37/42LC2***, 32/37/42LC2D, 32LC25R*, 26/32LC3R*, 26/32/37/42LC4R*, 26/32/37/42LC7R*, 19/22/26/32LD3**, 32/37/42/47LD4**, 42/47/55LD5**, 32/37/42/47/55LD6***, 32/37/42LE2***, 32LE3*** 32/42/47/55LE4***, 22/26/32/37/42/47/55LE5***, 22/26LE6***, 32/37/42/47/55LE7***, 42/47/55LE8***,

32/37/42/47LF11, 47LF21, 32/37/42LF25**, 32/42/47LF51**, 22/26/32/37/42/47LG1***, 32/37/42LG2***, 19/22//26/32/37/42LG2***, 19/22/26/32/37/42/47LG3, 26/32LG40, 32/37/42/47/52LG5***, 32/37/42/47/52LG60, 32/42/47/52LG70, 47LG90, 42/47LGX, 22/26/32/37/42LH2***, 19/22/26/32/37/42/52LH2***, 32/37/42/47LH3***, 32/37/42/47LH30**, 42/47LH300C, 32/37/42LH35FD, 32/37/42/47/55LH4***, 32/37/42/47/55LH5***, 32/37/42/47LH70**, 47/55LH8***, 42/47/55LH9***, 22/26/32LK3**, 32/37/42/47LK4**, 42/47/55LK5**, 32/39/42/47/55/60LN541C, 32/39/42/47/55/60LN549E, 32/42LP560M, 19/22LS4D*, 19/22LU40**, 19/22/26LU5***, 19/22/26/32LV25**, 26/32/37/42/47/55LV3***, 32/42/47/55LV3***, 32/42/47/55LW45**, 19/22/26/32LV25, 26/32LV30**, 32/42LV33**, 32/37/42/47/55LV35**, 22/26/32/37/42/47/55LV55**, 32/42LV34**, 32/42/47/55LW45**, 42/47LW54**, 42/47LW57**, 42/47/55LW65**, 47/55LW77**, 47/55LW95**, 47/55LW98**, 72LW99**, 32LX2R*, 42/47/55LX6***, 47/55LX9***, 22/29/32/39/42/47/55/60/65LY340C, 42/47/55/65LY540S, 42/47/55LZ96** , 60PC4R*, 32/37/42/47/55SL8***, 42/47SL9***, 42/47/55/60WL30MS, M197WD, M227WD, M237WD, M2901S, M3204C, M3801S, M4212C, M4712C.

PLASMA: 42/50PA45**, 42/50PA49**, 50/60PA65**, 42PC1***, 42PC1RV*, 42/50PC3***, 42PC3D, 42PC3DV, 50PC3D, 42PC3R*, 60PC4R*, 32PC5DVC, 42PC5RV*, 32/42/50PC5***, 42PC7R*, 42/50PG1***, 42/50PG10**, 42/50PG2***, 42/50PG20**, 42/50PG25, 42/50/60PG30**, 50/60PG60, 42/50PJ250, 42/50PJ3**, 42/50PJ550, 42PJ650, 50/60PK2**, 50PK3**, 50/60PK5**, 50/60PK7***, 50/60PK9***, 42/50PM1/3M**, 42/50PQ10, 42/50PQ20, 42/50PQ30**, 42/50PQ31, 42/50PQ35**, 42/50PQ60**, 42PQ65**, 50/60PS10, 42/50PS20**, 50PS30**, 50/60PS60**, 50PS65**, 50/60PS70**, 50/60PS80**, 42/50PT25**, 42/50PT35**, 50/60PV25**, 42/50PW35**, 42/50PW45**, 50/60PX9***, 60PY3RF*, 50/60PZ55**, 50/60PZ57**, 50/60PZ2**, 50/60PZ57**, 50/60PZ95**.

It is recommended that installers examine the RS232 control tables towards the end of all LG manuals and find the "xb" command, and check the allocation for the top 4 bits on the RGB command. Then use Group 1 or Group 2 commands as appropriate. Note: Some panels are listed in two different manuals, with **different** codes allocated. Also, we have found some panels need latest firmware upgrades to communicate at all. If your panel turns on and off but will not change channels, try other codes from this group. If nothing helps, call LG for an upgrade.

We have also found some panels support both "kb" and "xb" command sets. Also, some panels which show "xb" support in the manual ONLY have "kb" support. LG lies!

Another, older, group uses an "i" as a leading character for the source setting string: these are NOT drivable with these drivers, although they could be added if required.

Function code	**Group 4** **"xb" strings, code 97, 98 hex**	**Group 5** **"xb" strings, code 99, 9A hex**	**Comments** 97 hex or 99 hex DTV 98 hex or 9A hex ATV
Input1/Computer1	'xb 00 **50**' + 0D	'xb 00 **60**' + 0D	RGB-PC
Input2/Computer2	'xb 00 91' + 0D	'xb 00 91' + 0D	HDMI-2 (Changed at V097)
Input3/Video1	'xb 00 20' + 0D	'xb 00 20' + 0D	AV1 Video/S-Video * OPT1 swaps Video1 &Video2
Input4/Video2	'xb 00 90' + 0D	'xb 00 90' + 0D	HDMI-1 * * OPT1 swaps Video1 &Video2
Input4/Video2	'xb 00 21' + 0D	'xb 00 21' + 0D	AV2 if OPT6 On * OPT1 swaps Video1 &Video2
Input5	'xb 00 30' + 0D	'xb 00 30' + 0D	S-Video (some only)
Input6	'xb 00 40' + 0D	'xb 00 40' + 0D	Component 1 Video YPbPr
Input7	'xb 00 41' + 0D	'xb 00 41' + 0D	Component 2 Video YPbPr
Input8	'xb 00 70' + 0D	'xb 00 70' + 0D	HDMI/DVI (some only)
Input9	'xb 00 80' + 0D	'xb 00 80' + 0D	HDMI/DVI (some only)
Input10	'xb 00 90' + 0D	'xb 00 90' + 0D	Select HDMI-1
Input11	'xb 00 91' + 0D	'xb 00 91' + 0D	HDMI-2 / SDI / DTV
Input12	'xb 00 92' + 0D	'xb 00 92' + 0D	HDMI-3
Input13	'xb 00 93' + 0D	'xb 00 93' + 0D	HDMI-4
Input14	'xb 00 A0' + 0D	'xb 00 A0' + 0D	HDMI-PC (some only)
Input15	'xb 00 A1' + 0D	'xb 00 A1' + 0D	HDMI-2 / SDI / DTV
Input16	'xb 00 B0' + 0D	'xb 00 B0' + 0D	SuperSign

Input17	'xb 00 C0' + 0D	'xb 00 C0' + 0D	DisplayPort(DTV) (some only)
Input18	'xb 00 D0' + 0D	'xb 00 D0' + 0D	DisplayPort(PC) (some only)
TV Channel Up	'mc 00 00' + 0D	'mc 00 00' + 0D	Use IR command PR+ CH+
TV Channel Down	'mc 00 01' + 0D	'mc 00 01' + 0D	Use IR command PR- CH-

* T440: OPT6 switch ON will use AV2 Video in place of HDMI. T430: uses HDMI as Video2.

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

```
TV := 'xb 00 00' + 0D;      // TV Digital (Code 97 hex or 99 hex selects)
TV := 'xb 00 10' + 0D;      // TV Analog (Code 98 hex or 9A hex selects)
```

Aspect Ratio settings

Use the procedure shown in Part A of the T430/T440 manual:

```
SetAspect1      := 'kc 00 01' + 0D;   // Normal 4:3
SetAspect2      := 'kc 00 02' + 0D;   // 16:9
```

General comments

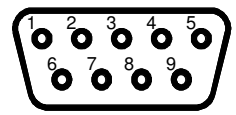
These panels can be used with a number of keyboards:

- With a "Code 9" or "Code B" keyboard, with buttons selecting "Video" and 'Computer", with "Volume Up/Dn";
- With a "Code E" keyboard, with buttons selecting "TV", "Video" and "Computer", with TV channel Up/Down and Volume control keys. (The TV channel commands send incremental (i.e. up and down) commands), so the limits are set in the panel.)
- No OPT7 handshake mode is provided. Power on panel connection blink codes available.
- Freeze command is not available.

RS232 connections to LG LCD, LG Plasma and Zenith flat screens

These use a 9-pin-D9 male on the panel, female on cable. Coms is at 9600, 8N1

Function/Direction	**T440 "projector" Connection**	**Fujitsu "Control" Port Connector**
Ground	Ground	9-pin D-sub pin 5
Data from T440 to projector	Tx	9-pin D-sub pin 2 (RXD)
Reply data from projector to T440	Rx	9-pin D-sub pin 3 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C



D-sub 9 female solder side

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.
Some have clamp diodes on signal lines so voltages may be limited to -0.7 volts and plus 5v signal pulses.

Some might use reverse 2/3.

Mitsubishi LCD: LDT321V, LDT323V, LDT422V, LDT461V2, MDT521S, MTD651S, MTD652S: (Code 48 hex)

(MDT321S , LDT462V, LDT551V see NEC Multeos below)

RS232 codes are at:
http://www.mitsubishielectric.com.au/assets/vis/RS232_485_LAN_Serial_Command_Control_MDT652S.doc.pdf

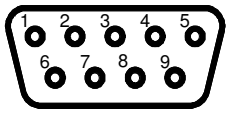
Function code	NEC LCD 00_r/00_v and M40/46 (old codes)	Comments
Input1/Computer1	'00_r3' + 0D	Computer1 RGB 1 VGA analog-RGB
Input2/Computer2	'00_r4' + 0D	RGB/HV into BNC sockets
Input3/Video1	'00_v1' + 0D	Composite Video * OPT1 swaps Video1 &Video2
Input4/Video2	'00_r1' + 0D	HDMI * * OPT1 swaps Video1 &Video2
* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2. S-Video code: '00_v3' + 0D		
Input5	'00_v2' + 0D	Component 1 Video YPbPr (RCA)
Input6	'00_r1' + 0D	HDMI
Input7	'00_r2' + 0D	DVI-D
Input8	'00_r5' + 0D	Network
Input9	'00_v3' + 0D	S-Video

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

- On panel connection blink codes supported on M40/M60 and all with new codes;
- OPT7 handshake mode is not available with old codes, but is on M40/M60 and all with new codes;
- Mute and Freeze is not supported at all;

RS232 connections to Mitsubishi LCD with D9 (not sighted, taken from manual)

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, Odd parity, 1 stop.

Function/Direction	T440 "projector" Connection	"Serial" Port Connector	
Ground	Ground	9-pin D-sub pin 5	 D-sub 9 female solder side
Data from T440 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T440	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

NEC LCD: (Code 60 hex) Old codes for: 3000/3210/4000/4010/4020/4610/4620/ 5220/5710/6520P/L, SC40/SC46, M40/M46 Old T1, Old T2

(See 64/65/66 hex below for Multeos new drivers.)

NEC Plasma: (Code 60 hex) 42XC10/42XP10, 50XC10/50XP10, 60XC10/60XP10

In the back of each user's manual is a list of typical channel selection messages, and manuals of NEC LCD panels are available at http://www.nec-display-solutions.co.uk/c/g/uk/en/Service/Home/index.html

Function code	**NEC LCD 00_r/00_v and M40/46 (old codes)**	**Comments**
Input1/Computer1	'00_r2' + 0D	D-SUB VGA
Input2/Computer2	'00_r3' + 0D	RGB/HV into BNC sockets
Input3/Video1	'00_v1' + 0D	Composite Video 1 * (OPT1 swaps Video1 & Video2)
Input4/Video2	'00_h1' + 0D	HDMI * Some only * (OPT1 swaps Video1 & Video2)
Input5	'00_v2' + 0D	Component DVD/DV on BNC
Input6	'00_v4' + 0D	Video 2 *some only
Input7	'00_r1' + 0D	DVI-D digital
Input8	'00_h1' + 0D	HDMI * Some only
Input9	'00_v3' + 0D	S-Video

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

- No blink codes supported;
- OPT7 handshake mode is not available with old codes, but is on M40/M60 and all with new codes;
- Freeze is not supported at all;
- Turn off ECO mode of the panel to enable On/Off control (some only)
- Switch "INPUT DETECT" to "NONE" to prevent channel changing when non-selected signals come and go;
- "DVI MODE" may need to be setup to control type of input signal expected on that input;
- "S-VIDEO MODE" should be set to "SEPARATE" so users can select between Composite Video and S-Video sources (some only).

NEC LCD: (Code 64 hex HDMI 1, Code 65 hex HDMI 2), Mit Code $66

Multeos and Multisync models LCD3210, LCD3215, LCD4215, LCD4615, LCD5710, LCD8205, MDT652S, M401/M461/M521, P401, P402, P461, P462, P521, P552, P553, P701, P702, P703, S401, S461, S521, V321, V322, V422, V423, V461, V462, V463, X464UN/UNV, V551, V552, V651, V652, V3212, V801, X431BT, X461HB, X461S, X461UN, X463UN, X551S, X551UN, X554UN/UNS

Mitsubishi MDT321S (no HDMI)

Mitsubishi LCD: LDT462V, LDT551V, MDT652S Code 66 hex has HDMI as Video 2

In the back of each user's manual is a list of typical channel selection messages, and manuals of NEC LCD panels are available at http://www.nec-display-solutions.co.uk/c/g/uk/en/Service/Home/index.html

Function code	M40/46 Multeos	Comments
Input1/Computer1	'00600001'	Select RGB-PC
Input2/Computer2	'00600002'	RGB/HV into BNC sockets
Input3/Video1	'00600005'	Composite Video * (OPT1 swaps Video1 & Video2)
Input4/Video2	'00600004' Code $64	HDMI/DVD * * (OPT1 swaps Video1 & Video2)
Input4/Video2	'00600011' Code $65	HDMI * * (OPT1 swaps Video1 & Video2)
Input4/Video2	'00600003' Code $66	HDMI * * (OPT1 swaps Video1 & Video2)
Input5	'0060000C'	Component 1 Video YPbPr (RCA)
Input6	'00600003'	Video 2
Input7	'00600004'	DVI-D digital / HDMI
Input8	'00600011'	HDMI VESA * Some only
TV	'0060000A'	Digital TV * Some only
TV Channel Up	'008B0001'	
TV Channel Down	'008B0002'	

- T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.
- On panel connection blink codes supported with new codes;
- OPT7 handshake mode is available with new codes;
- Audio control (Volume up/down keyboards, codes 2, 9, B, and E) is ONLY supported in M40/M46 Multeos mode and all with new codes (64 hex). **NOTE: Variable audio control and audio mute is only available to the speaker-level drive. It is NOT able to control the line-level audio out to the RCA connectors.** Use on-screen setup to manually allocate audio inputs to channels;
- Two-yellow button "Mute" command is available on "64/65 hex" code displays, but ONLY to the audio and only to the speaker drive. No picture mute is provided;
- Freeze is not supported at all;
- Turn off ECO mode of the panel to enable On/Off control (some only)
- Switch "INPUT DETECT" to "NONE" to prevent channel changing when non-selected signals come and go;
- "DVI MODE" may need to be setup to control type of input signal expected on that input;
- "S-VIDEO MODE" should be set to "SEPARATE" so users can select between Composite Video and S-Video sources (some only).
- TV control (keyboard code 'E') is only available for M40/M46 in Multeos mode. It uses incremental Up and Down buttons.

NEC LCD E-Series: Code 67 hex E324, E424, E464, E554, E654

Control codes for this range are at: http://www.hdtvreview.com/pdf/nec-e654-quickstart.pdf and http://au.nec.com/en_AU/media/docs/products/displays/ExternalControlManual-E-Series_en.pdf

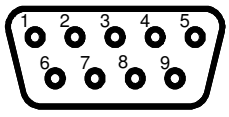
(Unfortunately not all info is in these documents, e.g. reply to GET commands and absolute volume codes.)

Function code	E-series codes	Comments
Input1/Computer1	'00600001'	Select RGB-PC DB15 *(OPT5 swaps Video1 & Video2)
Input2/Computer2	'00600012'	HDMI 2 *(OPT5 swaps Video1 & Video2)
Input3/Video1	'00600005'	Composite Video * (OPT1 swaps Video1 & Video2)
Input4/Video2	'00600011'	HDMI 1 * (OPT1 swaps Video1 & Video2)
Input5	'00600013'	HDMI 3
Input6	'0060000C'	Component Video YPbPr (RCA)
Input7	'00600014'	USB
TV	'0060000A'	Digital TV
TV Channel Up	'008B0001'	
TV Channel Down	'008B0002'	

- On panel connection blink codes supported with new codes. (subject to testing);;
- OPT7 handshake mode is available with new codes. (subject to testing);
- Audio control (Volume up/down keyboards, codes 2, 9, B, and E) is supported in Incremental mode: and sends five Inc. or Dec. commands. NOTE: Variable audio control and audio mute is only available to the speaker-level drive. It is NOT able to control the line-level audio out to the RCA connectors. Use on-screen setup to manually allocate audio inputs to channels;
- No picture mute or freeze is provided;
- Turn off ECO mode of the panel to enable On/Off control (some only)
- Switch "INPUT DETECT" to "NONE" to prevent channel changing when non-selected signals come and go;

RS232 connections to NEC LCD with D9

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, Odd parity, 1 stop.

Function/Direction	T440 "projector" Connection	"Serial" Port Connector	
Ground	Ground	9-pin D-sub pin 5	 D-sub 9 female solder side
Data from T440 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T440	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

NEC NLT-40/46FHD100, Sherwood LF-401-TB5 TV/LCD panel (Codes 95 & 96 hex), (Made by "indtek" in Korea as LC-401EB3 and LC-461EB3, also sold by Grundig.)

There are two drivers for this: these are same for Computer and Video, but the TV function can select Full HD Digital tuner (Code 1C hex) or analog tuner (Code 1D hex)

This family has many members with a range of channel messages.

Channel codes are:

```
Input1   := 'kb 00 7' + 0D;        //Computer1 Select PC-RGB
Input2   := 'kb 00 8' + 0D;        //Computer2 Select HDMI-1

Input3   := 'kb 00 2' + 0D;        //Video1 AV1 Comp Video   * (OPT1 swaps Video1 & Video2)
Input4   := 'kb 00 A' + 0D;        // Video2 HDMI             * (OPT1 swaps Video1 & Video2)
```

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

```
Input4   := 'kb 00 5' + 0D;        //Video4 S-Vid *

Input5   := 'kb 00 3' + 0D;        // LG_kb; AV2
Input6   := 'kb 00 4' + 0D;        // LG_kb; AV3

Input7   := 'kb 00 6' + 0D;        // Component
Input8   := 'kb 00 A' + 0D;        // HDMI 3 (option)
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

```
TV       := 'kb 00 0' + 0D;        // TV Digital (Code 95 hex selects)
TV       := 'kb 00 1' + 0D;        // TV Analog (Code 96 hex selects)
```

This panel can be used with a number of keyboards:

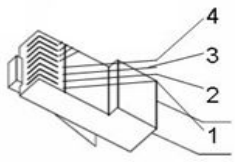
- With "Code 9" or "Code 8 or A" keyboards, with buttons selecting "Video" and 'Computer", with either "Volume" (code 9) or "Freeze/Mute" (Code A);
- With a "Code B-L" or "Code B-P" keyboard, with buttons selecting "Video" and "Computer1" and "Computer2" with Volume control keys; or
- With a "Code E" keyboard, with buttons selecting "TV", "Video" and "Computer", with TV channel Up/Down and Volume control keys. (The channel commands send incremental (i.e. up and down) commands), so the limits are set in the panel.)

(Keyboards B and E combine channel keys with "On" keys.)

- Panel connection blink codes are available but OPT7 handshake mode is NOT.

RS232 connections to Sherwood TV/LCD panel

These use a RG45 on the LCD, female on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop.

Function/Direction	**T440 "projector" Connection**	**RG45 Connector EIA568A**	
Ground	Ground	Pin 3 (orange-white) & pin 4 (solid blue)	
Data from T440 to projector	Tx	Pin 1, green-white	
Reply data from projector to T440	Rx	Pin 2, solid green	

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

NEC Plasma PX-42/50/60/61, MP/VM/VP/VR/XM/XR, 2/3/4/5/6 (Code 14 hex)

This family has many members with a range of channel messages.

There is a typical RS232 code Operation Manual at: http://www.prokare.com.tr/pdf2/nec_residental_plasma_rs232.pdf

And http://www.nec-display-solutions.co.uk/c/g/uk/en/Service/Home/index.html

Channel codes are:

```
Input1   := DF + 80 + 60 + 47 + 01 + 07 + 0E;     //Computer1 RGB1 / PC1  DB15
Input2   := DF + 80 + 60 + 47 + 01 + 08 + 0F;     //Computer2 RGB2 / PC2  5 x BNC

Input3   := DF + 80 + 60 + 47 + 01 + 02 + 09;     //Video1 "Video2"  RCA Composite Video*
Input4   := DF + 80 + 60 + 47 + 01 + 0C + 13;     //Video2 RGB3 DVI-D  ) *
* (OPT1 swaps Video1 & Video2)
```

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

```
*Input4  := DF + 80 + 60 + 47 + 01 + 03 + 0A;     //Video2 "Video3"  S-VIDEO DIN-4

Input5   := DF + 80 + 60 + 47 + 01 + 01 + 08;     // "Video1"  BNC
Input6   := DF + 80 + 60 + 47 + 01 + 05 + 0C;     // HD1 3 x RCA DTV1/Component
Input7   := DF + 80 + 60 + 47 + 01 + 06 + 0D;     // HD2 5 x BNC DTV2/Component or SCART1/2
Input8   := DF + 80 + 60 + 47 + 01 + 0C + 13;     // RGB3 / PC3  DVI-D

Input9   := DF + 80 + 60 + 47 + 01 + 0E + 15;     // HD3 DVI/HDMI  (some only)
Input10  := DF + 80 + 60 + 47 + 01 + 1A + 21;     // HD4 DVD/HDMI  (some only)

Input11  := DF + 80 + 60 + 47 + 01 + 03 + 0A;     //Video2 "Video3"  S-VIDEO DIN-4
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

This panel can be used with a number of keyboards:

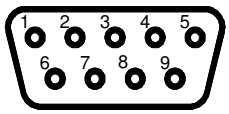
- With a "Code 9" keyboard, with buttons selecting "Video" and 'Computer", with "Volume" keys.
- With a "Code B-L" or "Code B-P" keyboard, with buttons selecting "Video" and "Computer1" and "Computer2" with "Volume" control keys. (Keyboards combine channel keys with "On" keys.)
- (There is no point in using a Code 8 or A keyboard, as there is no "Freeze" function on plasma screens.

Panel connection blink codes are available but OPT7 handshake mode in NOT.

Audio mute with 2 Vol keys is available, but not video.

RS232 connections to NEC Plasma with D9

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, Odd parity, 1 stop.

Function/Direction	**T440 "projector" Connection**	**"Serial" Port Connector**	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T440 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T440	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	"RTS"	9-pin D-sub pin 8(CTS IN)	

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Panasonic LCD panels: (Codes 56, 57 hex) (Vol 0->100)

There are many displays covered by these drivers, but to determine the appropriate one to use, please examine the pages in the user manual of your display to see which is needed. Do a search (Ctrl "F") for "9600" (the coms baud rate) to get to the page "Serial Terminals connection". This or the next page shows the inputs for this model. Compare these to the table below to see commands needed.

Units with "AV1" available (Code 56 hex):

TH-42LF6U, TH-47LF6U, TH-55LF6U, TH-42LF30U, TH-47LF30U, TH-70LF50W, TH-80LF50W, TH-42LF60U, TH-47LF60U, TH-55LF60U, TH-42LFP30, TH-47LFP30

```
Input1    := 02 + 'IMS:PC1' + 03;          // Computer1  DB15
Input2    := 02 + 'IMS:DV1' + 03;          // Computer2  DVI-D

Input3    := 02 + 'IMS:AV1' + 03;          // Video1 (not all ... overwrite if nec. with HM1 see below)
Input4    := 02 + 'IMS:HM1' + 03;          // Video2   HDMI 1

Input5    := 02 + 'IMS:HM2' + 03;          // HDMI 2

Input6    := 02 + 'IMS:AV2' + 03;          // AV2
Input7    := 02 + 'IMS:AV2YBR' + 03;
Input8    := 02 + 'IMS:AV2RGB' + 03;

Input9    := 02 + 'IMS:SL1' + 03;          // Slot 1
Input10   := 02 + 'IMS:SL1YUV' + 03;       // Slot 1
Input11   := 02 + 'IMS:SL1RGB' + 03;       // Slot 1

Input12   := 02 + 'IMS:S1A' + 03;          // Slot 1A
Input13   := 02 + 'IMS:S1AYUV' + 03;       // Slot 1A
Input14   := 02 + 'IMS:S1ARGB' + 03;       // Slot 1A

Input15   := 02 + 'IMS:S1B' + 03;          // Slot 1B
Input16   := 02 + 'IMS:S1BYUV' + 03;       // Slot 1B
Input17   := 02 + 'IMS:S1BRGB' + 03;       // Slot 1B

Input18   := 02 + 'IMS:DV1YUV' + 03;       // DVI    (These codes suspiciously called DVIYUV
Input19   := 02 + 'IMS:DV1RGB' + 03;       // DVI    (sometimes. This looks like a mis-print.)

Input20   := 02 + 'IMS:DL1' + 03;          // DigitalLink
```

Units with "AV1" un-available (Code 57 hex):

TH-42LF5U, TH-47LF5U, TH-42LFE6E, TH-50LFE6E, TH-47LFT30, TH-47LFX6J

As above, except:

```
Input1    := 02 + 'IMS:PC1' + 03;          // Computer1  DB15
Input2    := 02 + 'IMS:DV1' + 03;          // Computer2  DVI-D

Input3    := 02 + 'IMS:HM1' + 03;          // Video1 overwrite with HDMI 1
Input4    := 02 + 'IMS:HM1' + 03;          // Video2     HDMI 1
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

- On panel connection blink codes supported and OPT7 handshake mode is supported;
- Enable the RS-232 control access by going to "Setup" then to "Network Setup" then "Control I/F Select" and set "RS-232";
- Audio control 0->100 (Volume up/down keyboards, codes 2, 9, B, and E) is available;
- Freeze is not supported at all;

Panasonic Plasma panels: (Codes 50 ... 53 hex) (Vol 0->63)

There are many displays covered by these drivers, but to determine the appropriate one to use, please examine the pages in the user manual of your display to see which needed. Look for a page entitled "SERIAL Terminals" which will list the commands needed by that monitor, and choose the driver that suits. The strings needed are always listed there. Separate, more detailed documents called "PDP Control Command" are available on request from Panasonic, but are not generally held on publicly accessible web sites. (Google will fetch some of these if you search for "PDP Control Command" (note quotes).)

Units with "IIS" commands (Code 50 hex):

```
Input1    := 02 + 'IIS:RG1' + 03;      //Computer1  RGB
Input2    := 02 + 'IIS:YP1' + 03;      //Computer2  Component

Input3    := 02 + 'IIS:VID' + 03;      //Video1     Video
Input4    := 02 + 'IIS:SVD' + 03;      //Video2     S-Video

Input5    := 02 + 'IIS:YP' + 03;       //Video2     Component  (alt)
```

Units with "IMS" commands (Code 51 hex) (early group TH-nnPx3/4/5, TH-61PHW6):

```
Input1    := 02 + 'IMS:RG1' + 03;      //Computer1  RGB
Input2    := 02 + 'IMS:YP1' + 03;      //Computer2  Component

Input3    := 02 + 'IMS:VID' + 03;      //Video1     Video
Input4    := 02 + 'IMS:YP1' + 03;      //Video2     Component
```

Units with slot commands (Code 52 hex) (TH-nnPx6/7/8/9/10/11/12, TH-nnVX100)

```
Input1    := 02 + 'IMS:PC1' + 03;      //Computer1  DB15
Input2    := 02 + 'IMS:SL1' + 03;      //Computer2  Slot 1
Input3    := 02 + 'IMS:SL2' + 03;      //Video1     Slot 2
Input4    := 02 + 'IMS:SL3' + 03;      //Video2     Slot 3

Input6    := 02 + 'IMS:SL1' + 03;      //Slot 1
Input9    := 02 + 'IMS:SL1A' + 03;     //Slot 1
Input10   := 02 + 'IMS:SL1B' + 03;     //Slot 1

Input12   := 02 + 'IMS:SL2' + 03;      //Slot 2
Input13   := 02 + 'IMS:SL2A' + 03;     //Slot 2
Input14   := 02 + 'IMS:SL2A' + 03;     //Slot 2
Input15   := 02 + 'IMS:SL3' + 03;      //Slot 3
```

Units with slot commands (Code 53 hex) (TH-nnPx20)

```
Input1    := 02 + 'IMS:PC1' + 03;      //Computer1  DB15
Input2    := 02 + 'IMS:DV1' + 03;      //Computer2  DVI-D

Input3    := 02 + 'IMS:VD1' + 03;      //Video1     Comp Vid
Input4    := 02 + 'IMS:HM1' + 03;      //Video2     HDMI

Input5    := 02 + 'IMS:YP1' + 03;      //Component/RGB input BNC 20

Input6    := 02 + 'IMS:SL1' + 03;      //Slot 1
Input7    := 02 + 'IMS:S1A' + 03;      //Slot 1
Input8    := 02 + 'IMS:S1B' + 03;      //Slot 1
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

- On panel connection blink codes supported and OPT7 handshake mode is supported;
- Audio control (Volume up/down keyboards, codes 2, 9, B, and E) is available;
- Freeze is not supported at all;

Male and female D9 connectors are used variously, and pin-out is shown in all manuals.

Panasonic LCD TV / panel, IR interface only: (Code A0 hex)

Models covered:

65 inch	TH-P65ST50A
50 inch	TH-P50UT 50A
32 inch	TH-L32XMA
50 inch	TH-P50UT 30A

These units use IR only, and we have implemented a basic control via IR for them.

In a simple mode, a **T440 Code6-KB1** keyboard can be used to provide basic On/Off functionality. It has no absolute On and Off commands, so the same command is used for both On and Off (programmed into both keys). Turning Off uses just ONE transmission of the code (not two, as in most other panels.)

In a more complex installation, a **T440-code E** keyboard can be used, with some compromises and re-labelling needed to make it clear what goes on.

This panel has a strange split source selection. A **TV** key on the remote absolutely selects the TV function, and we have mimicked this in the Code E, so the TV button selects the TV mode, and the Channel Up and Channel down (and the Volume Up and Volume Down) functions all work as normal.

However, all the other sources are selected via the **AV** key, and we have mapped this to the "Video" key on the T440. (If you have only single other source, eg Composite Video or HDMI, select just that in the TV / panel, and pressing the Video (now AV function) will select this as the alternative to the TV function. If you need more channels, the "Computer" key has been programmed to send an "OK" code, and the "Channel" keys are reprogrammed away from the TV function to send the (different from Channel) "Up arrow" and "Down Arrow" codes.

So to select any one of a number of (non-TV) sources, press the "AV" button and the source menu will appear on the TV / panel. Then use the Channel Up / Down keys to navigate to the desired source (of many) and then press the "Computer" key (now acting as the "OK") to select and activate that channel.

Yes, it's confusing, but all we can offer at the moment. (The new T470 from JED will have re-label able keys, so will be able to have a correctly labelled set of keys for all the above. Stay tuned!)

Philips BDL series LCD (LED backlit) panels (Code 44, 45, 46, 47 hex)

Philips have (currently) four (sorry ... five!) different serial protocols in current use and for sale in LCD/LED panels, and there is no central record or listing of which panels use which protocol. It seems that when a panel's software is updated (which can be done via a USB stick) the protocol of that panel can change, as well. (Note: the software revision numbers in the panels bear no relation to the protocol version numbers.) The four supported here all run at 9600 8N1, and also use two different connector systems, some a 4-sleeve miniature audio-type jack (supplied by Philips, cabled to a DB9), and some a DB9 male on the panel. (A fifth system protocol, called SerialXpress for HotelTV uses a 10-pin RJ50 connector, and runs at 38400 baud 8N1, and takes 66 pages to describe. Not supported yet.)

Protocol 1.6 (code 44h) and 2.0 (code 45h) are "non-addressed" protocol strings. If you don't know what protocol a particular panel uses, try 8000 and 8100 first. If it is a "non-addressed" protocol it will show Comms OK (one red LED blink) when connected and selected for this. If it shows three blinks, try the other two (below) --- it may be an "addressed" protocol that is being used (codes 46h and 47h). If it is correctly a "non-addressed" protocol, and several source commands do not work, try the other "non-addressed" one. Similarly, if you have identified the panel as "addressed" (longer messages), and e.g. the HDMI2 command selects VGA, then try the other "addressed" one.

Code 44 (Non-addressed Protocol 1.6): Some models we know of matching this driver are:
BDL4230E/BDL4230ET, BDL4651VH, BDL4675XU, BDL4681XU, BDL4785SL, BDL5530EL, BDL5585XL, BDL6450AT, BDL6531E, BDL6551V

The first group support revision 1.6 of the protocol spec. Channel codes are:

```
Input1    := 08 + 01 + AC + 05 + 00 + 01 + 00 + A1;    //Computer 1: PC Digital VGA
Input2    := 08 + 01 + AC + 09 + 01 + 01 + 00 + AC;    //Computer 2: DVI-D

Input3    := 08 + 01 + AC + 01 + 00 + 01 + 00 + A5;    //Video 1 *   (OPT1 swaps Video1 & Video2)
Input4    := 08 + 01 + AC + 09 + 00 + 01 + 00 + AD;    //Video 2 HDMI 1 * (OPT1 swaps Video1 & Video2)
```

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

```
Input4    := 08 + 01 + AC + 01 + 01 + 01 + 00 + A4;    //Video 2 S-Video

Input5    := 08 + 01 + AC + 03 + 00 + 01 + 00 + A7;    // Component
Input6    := 08 + 01 + AC + 07 + 01 + 01 + 00 + A2;    // DisplayPort
Input7    := 08 + 01 + AC + 08 + 00 + 01 + 00 + AC;    // Card OPS
```

Code 45 (Non-addressed Protocol 2.0) for models **BDL3245E, BDL4245E, BDL4645E,** maybe **BDL4231.**

```
Input1    := 08 + 01 + AC + 05 + 00 + 00 + 00 + A0;    //Computer 1: PC VGA
Input2    := 08 + 01 + AC + 09 + 01 + 01 + 00 + AC;    //Computer 2: DVI-D (unchanged)

Input3    := 08 + 01 + AC + 01 + 00 + 00 + 00 + A4;    //Video 1  AV Input * (OPT1 swaps Video1 & Video2)
Input4    := 08 + 01 + AC + 09 + 00 + 00 + 00 + AC;    //Video 2 HDMI 1 * (OPT1 swaps Video1 & Video2)
```

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

```
Input4    := 08 + 01 + AC + 01 + 01 + 01 + 00 + A4;    //Video 2 S-Video  (undocumented)

Input5    := 08 + 01 + AC + 03 + 00 + 00 + 00 + A6;    // Component 1
Input6    := 08 + 01 + AC + 03 + 01 + 00 + 00 + A7;    // Component 2

Input7    := 08 + 01 + AC + 09 + 01 + 00 + 00 + AD;    // HDMI 2

Input8    := 08 + 01 + AC + 01 + 01 + 00 + 00 + A5;    // Card OPS
```

Code 46 (Addressed Protocol 1.86) for BDLxx20QL. Channel codes are:

```
Input1    := 09 + 01 + 01 + AC + 05 + 00 + 01 + 00 + A1;  //Computer 1: PC Digital VGA
Input2    := 09 + 01 + 01 + AC + 05 + 01 + 01 + 00 + A0;  //Computer 2: HDMI 2

Input3    := 09 + 01 + 01 + AC + 01 + 00 + 01 + 00 + A5;  //Video 1*  Video (OPT1 swaps Video1 & Video2)
Input4    := 09 + 01 + 01 + AC + 09 + 00 + 01 + 00 + AD;  //Video 2* HDMI 1 (OPT1 swaps Video1 & Video2)
```

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

Input4 := 09 + 01 + 01 + AC + 01 + 01 + 01 + 00 + A4; //Video 2 S-Video

Input5 := 09 + 01 + 01 + AC + 03 + 00 + 01 + 00 + A7; // Component

Input6 := 09 + 01 + 01 + AC + 07 + 01 + 01 + 00 + A2; // DisplayPort 1
Input7 := 09 + 01 + 01 + AC + 06 + 01 + 01 + 00 + A3; // DisplayPort 2

Input8 := 09 + 01 + 01 + AC + 09 + 01 + 01 + 00 + AC; // DVI-D

Input9 := 09 + 01 + 01 + AC + 08 + 01 + 01 + 00 + AD; // USB-A

Channel codes are:

Input1 := 09 + 01 + 01 + AC + 05 + 00 + 01 + 00 + A1; //Computer 1: PC Digital VGA
Input2 := 09 + 01 + 01 + AC + 06 + 00 + 01 + 00 + A2; //Computer 2: HDMI 2

Input3 := 09 + 01 + 01 + AC + 01 + 00 + 01 + 00 + A5; //Video 1* Video (OPT1 swaps Video1 & Video2)
Input4 := 09 + 01 + 01 + AC + 0D + 00 + 01 + 00 + A9; //Video 2* HDMI 1 (OPT1 swaps Video1 & Video2)

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

Input4 := 09 + 01 + 01 + AC + 02 + 00 + 01 + 00 + A6; //Video 2 S-Video

Input5 := 09 + 01 + 01 + AC + 03 + 00 + 01 + 00 + A7; // Component

Input6 := 09 + 01 + 01 + AC + 0A + 00 + 01 + 00 + AE; // DisplayPort 1
Input7 := 09 + 01 + 01 + AC + 07 + 00 + 01 + 00 + A3; // DisplayPort 2

Input8 := 09 + 01 + 01 + AC + 0E + 00 + 01 + 00 + AA; // DVI-D

Input9 := 09 + 01 + 01 + AC + 0C + 00 + 01 + 00 + A8; // USB-A

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making HDMI the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2..

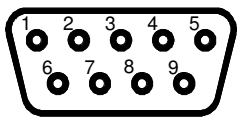
- OPT7 handshake mode is provided;
- No Picture and sound mute is available;
- Mute and freeze keyboard code 8 or A is not usable;
- Aspect ratio control is not supported.

RS232 connections to Philips LCD/LED with D9 OR JACK

Some use a 9-pin-D9 male on the LCD, female on cable. Others use a **4-sleeve miniature audio-type jack (supplied by Philips, cabled to a DB9).** Comms is at 9600 baud, 8 bits, no parity, 1 stop.

.

Function/Direction	**T440 "projector" Connection**	**"Serial" Port Connector**
Ground	Ground	9-pin D-sub pin 5
Data from T440 to panel	Tx	9-pin D-sub pin 3
Reply data from panel to T440	Rx	9-pin D-sub pin 2
Plus 9 volt CTS/DTR to panel	N/c	N/c



D-sub 9 female solder side

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Pioneer Plasma panels (Code 80 hex)

Some models we know of matching this driver are: **PDP-42/50MXE10, PDP-42/50MXE11, PDP-42/50/60MXE20, PDP-43/50MXE1, PDP-425/525CMX, PDP-434/505CMX.** All have same codes.

Channel codes are:

```
Input1   := 02 + '01IN1' + 03;      //Computer1 Select Ch 1 In   VGA DB15
Input2   := 02 + '01IN2' + 03;      //Computer2 Select Ch 2 In   DVI-D

Input3   := 02 + '01IN4' + 03;      //Video1 Select Ch 1 In  Video Composite
Input4   := 02 + '01IN3' + 03;      //Video2 Select Ch 2 In  S-Video

Input5   := 02 + '01IN5' + 03;      // Select Ch 3 In  Component
```

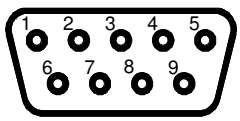
Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

On startup, the controller resets all existing ID fields and sets up an ID field of "01" for the connected plasma. This ID is then used at the start of each command.

- Power on panel connection blink codes are provided, but OPT7 handshake mode is possibly not available on some older models. Leave OPT7 OFF in this case;
- Auto Pixel Align is NOT available;
- Picture and sound mute is available with two-yellow-button mute mode with a "volume" keyboard;
- Mute and freeze keyboard code 8 or A are available;
- Make sure to turn off "Auto input search" if your panel includes this;
- Make sure to set the baud rate to 9600 and no parity if an adjustment menu is provided.

RS232 connections to Pioneer Plasma with D9

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop.

Function/Direction	**T440 "projector" Connection**	**"Serial" Port Connector**	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T440 to panel	Tx	9-pin D-sub pin 3	
Reply data from panel to T440	Rx	9-pin D-sub pin 2	
Plus 9 volt CTS/DTR to panel	N/c	N/c	

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Samsung LCD and Plasma panels: (Code 6C hex)

Plasma: 42”: P42H(n), P42H-2, PS-42P3ST, SPD-42P3SM, PPM42S2, PPM42S3, PS-42P2ST,
50”:P50H(n), P50FP, P50HP, PPM50H3, PS-50P2HT, PPM50H2, P50F(n), SPD-50P3HM,
63”: P63F(n), P63FP(x), PPM63H3, SPD-63P3HM,
Various: PPMxxM5x, PPMxxM7x.
LCD: 23”: 230MXn , 230TSn,
32”:320DX, 320MP(n), 320MX(n), 320P(N), 320PX , 323TSn,
40”: 400CX(n), 400DX , 400DX(n), 400FP(n), 400FX(n), 400MP(n), 400MX(n), 400P(n), 400PX(n), 400TSn, 400TX(n), 400UX(n), 403T, CT40CS(N),
46”: 460CX(n), 460DMn, 460DR(n), 460DX(n), 460FP(n), 460MP(n), 460MX(n), 460P(n), 460PX(n), 460Rn , 460TX(n), 460TS(n), 460UT(n), 460UX(n),
52”: 520DX(n), **57”:** 570DX(n),
65”: ME65B(n)
70”: 700DX , 700DX(n), 700DRn, 700TSn
75”: ME75B(n)
82”: 820DX, 820DX(n), 820TSn.

DBE/DME/DHE Series: DBxxE, DMxxE, DHxxE

LFD series: ME40A ME46A ME55A, DE40A DE46A DE55A, UE46A UE55A

The protocol is at http://www.samsung.com/us/pdf/MDC_400DXn460DXn570DXn700DXn820DXn460TXn_v1.pdf or Samsung Australia can also supply protocol data.

The messages sent have the third byte $FE, i.e. Global address, so a number of channels can be daisy-chained. (changed from $FF at release V094.)

Function code	**5th Byte of message with command code 14h**	**Comments**
Input1/Computer1	14h	D-SUB 15 RGB-PC
Input2/Computer2	1Eh	RGB into BNC
Input3/Video1	0Ch	Composite Video * (OPT1 swaps Video1 & Video2)
Input4/Video2	21h	HDMI * (OPT1 swaps Video1 & Video2)
Input5	08h	Component Video YPbPr (RCA)
Input6	18h	DVI
Input7	1Fh	DVI (HDCP)
Input8	21h	HDMI 1
Input9	22h	HDMI 1_PC
Input10	23h	HDMI 2
Input11	24h	HDMI 2_PC
Input12	25h	DisplayPort
Input13	20h	Magicinfo (MagicNet)
Input14	60h	Magicinfo Lite
Input15	04h	S-Video
TV	40h	Digital TV Some only
TV Channel Up	01h	
TV Channel Down	00h	

* T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

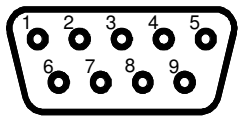
Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

- On panel connection blink codes supported and OPT7 handshake mode is supported;
- Audio control (Volume up/down keyboards, codes 2, 9, B, and E) is available;
- Two-yellow button "Mute" command is available, but ONLY to the audio;
- Freeze is not supported at all;
- Turn "Energy Saving" to "Off" (to enable RS232 control);
- Make sure to use the correct "In" RS232 port (there are two, an "In", and an "Out", for cascading);
- TV control (keyboard code 'E') is only available for units with digital tuners. It uses incremental Up and Down buttons.

RS232 connections to Samsung panel

These use a 9-pin-D9 male on the panel, female on cable. Comms is at 9600 baud, 8 N1.

Some use a 3.5mm stereo jack to D9 adaptor.

Function/Direction	**T440 "projector" Connection**	**"Serial" Port Connector**	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T440 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T440	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	n/c	n/c	

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Sharp LCD display/TV, IAVD family (NON-2012 LE series)(Codes 20 to 2E hex)

(2012 LE family following with codes 34-37 hex)

The Sharp LCD TV family use a wide range of allocations for channels, so we have coded them in many groups with the first four "Inputs" (Computer 1 & 2, Video 1 & 2) customised, and shown below against the particular selection codes.

Generic strings provide all options on all panels using all commands "IAVD 1<CR>" through "IAVD 9<CR>"

Generic Channel codes are:

```
Input5   := 'IAVD1   ' + 0D;      //  Generic 1
Input6   := 'IAVD2   ' + 0D;      //  Generic 2
Input7   := 'IAVD3   ' + 0D;      //  Generic 3
Input8   := 'IAVD4   ' + 0D;      //  Generic 4
Input9   := 'IAVD5   ' + 0D;      //  Generic 5
Input10 := 'IAVD6   ' + 0D;       //  Generic 6
Input11 := 'IAVD7   ' + 0D;       //  Generic 7
Input12 := 'IAVD8   ' + 0D;       //  Generic 8
Input13 := 'IAVD9   ' + 0D;       //  Generic 9

TV       := 'IDTV    ' + 0D;     // TV Digital  set this as default

TVChannelUp     := 'DTUP    ' + 0D;  //   Digital Up

TVChannelDown := 'DTDW    ' + 0D;  //   Digital Down
```

Specific strings allocating "IAVD" codes customised Computer 1 & 2, Video 1 & 2 strings, listed by selection code.

Sharp LCD panel: Code 20 hex.

(This group do NOT have any of DB15, DVI(-A or -D) so any "Computer" key must use HDMI or Component).

Input1/Computer1	Computer1	'IAVD 4' + 0D	Computer1 HDMI (no-DB15 or DVI screen)
Input2/Computer2	Computer2	'IAVD 1' + 0D	Computer2 Component (no-DB15 or DVI screen)
Input3/Video1	Video1	'IAVD 2' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 3' + 0D	Video2 S-Video / Video

Panel types for this code: LC32BD6X, LC37BD6X, LC26D4U, LC32D4U, LC37D4U, LC26DA5U, LC32DA5U, LC26D6U, LC32D6U, LC37D6U, LC32AX5, LC26GA5X

If other HDMI, component, etc is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 21 hex.

(This group has DB15 as "Input4" of the panel and HDMI 3 as "Input7" of the panel).

Input1/Computer1	Computer1	'IAVD 4' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'IAVD 7' + 0D	Computer2 HDMI 3
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 2' + 0D	Video2 Component/S-Video / Video

Panel types for this code: LC40LE700UN, LC46LE700UN, LC52LE700UN, LC52SB55U, LCC5255U, LC40E67UN, LC40E77UN, LC60E77UN, LC65E77UM, LC42BD80U, LC46BD80U, LC52BD80U, LC46D85UN, LC52D85UN, LCC4677UN, LCC5277UN, LC46E77U, LC52E77U, LC42D65U, LC46D65U, LC52D65U, LC32D44E/S, LC32D65E, LC32DH65E/S, LC37D65E, LC37DH65E/S

If other HDMI, component, etc is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 22 hex.

(This group has a DB15 as "Input 5" of the panel, and HDMI 2 as "Input 3" of the panel).

Input1/Computer1	Computer1	'IAVD 5' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'IAVD 3' + 0D	Computer2 HDMI 2
Input3/Video1	Video1	'IAVD 2' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 1' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LC32D33X, LC37D33X, LC32D53X, LC37D53X, LC32A33X, LC37A33X, LC32A53X, LC32A53X, LC37A53X, LC42A53X, LC30AA1M, LC37AA+A171M, LC30HV2M, LC30HV4M, LC37HV4/U, LC32AW5X, LC37AW5X, LC32PD5X, LC37PD5X, LC42PD5X, LC32PX5X, LC37PX5X, LC42PX5X

If other HDMI, component, etc is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 23 hex.

(This group has a DB15 as "Input 6" of the panel, and HDMI as "Input 5" of the panel).

Input1/Computer1	Computer1	'IAVD 6' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'IAVD 5' + 0D	Computer2 HDMI 2
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 2' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LC32D33X, LC37D33X, LC32D53X, LC37D53X, LC32A33X, LC37A33X, LC32A53X, LC32A53X, LC37A53X, LC42A53X, LC30AA1M, LC37AA+A171M, LC30HV2M, LC30HV4M, LC37HV4/U, LC32AW5X, LC37AW5X, LC32PD5X, LC37PD5X, LC42PD5X, LC32PX5X, LC37PX5X, LC42PX5X

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 24 hex.

(This group has a DB15 as “Input 7” of the panel, and HDMI 2 or 3 as “Input 6” of the panel).

Input1/Computer1	Computer1	'IAVD 7' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'IAVD 6' + 0D	Computer2 HDMI 2/3
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 2' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LC42D83X, LC46D83X, LC52D83X, LC65RX1X, LC46D84X, LC52D84X, LC37D85X, LC42D85X, LC46D85X/U, LC52D85X/U, LC37D63X, LC42D63X, LC46D63X, LC42A63X, LC32X20E/S, LC37X20E/S, LC42X20E/S, LC46X20E/S, LC52X20E/S, LC42D64U, LC46D64U, LC52D64U, LC65D64U, LC32GP3U/B/W/R, LC46SE94U, LC52SE94U, LC65SE94U, LC26AD5E/S, LC32AD5E/S.

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel’s User’s Manual are allocations of ‘IAVD’ codes against physical inputs.

Sharp LCD panel: Code 25 hex.

(This group has a DB15 as “Input 7” of the panel, and HDMI 2 or 3 as “Input 6” of the panel).

Input1/Computer1	Computer1	'IAVD 7' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'IAVD 6' + 0D	Computer2 HDMI 2/3
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 2' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LC42D83X, LC46D83X, LC52D83X, LC65RX1X, LC46D84X, LC52D84X, LC37D85X, LC42D85X, LC46D85X/U, LC52D85X/U, LC37D63X, LC42D63X, LC46D63X, LC42A63X, LC32X20E/S, LC37X20E/S, LC42X20E/S, LC46X20E/S, LC52X20E/S, LC42D64U, LC46D64U, LC52D64U, LC65D64U, LC32GP3U/B/W/R, LC46SE94U, LC52SE94U, LC65SE94U, LC26AD5E/S, LC32AD5E/S.

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel’s User’s Manual are allocations of ‘IAVD’ codes against physical inputs.

Sharp LCD panel: Code 26 hex.

(This group has a DB15 as “Input 7” of the panel, and HDMI as “Input 1” of the panel).

Input1/Computer1	Computer1	'IAVD 7' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'IAVD 1' + 0D	Computer2 HDMI
Input3/Video1	Video1	'IAVD 6' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 4' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LC40BL700X, LC46LB700X, LC40LE700X/U, LC52LE700X/U,

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 2A hex.

(This group has a DVI-A as "Input 4" of the panel).

Input1/Computer1	Computer1	'IAVD 4' + 0D	Computer1 DVI-A
Input2/Computer2	Computer2	'IAVD 3' + 0D	Computer2 Component / S-Video / Video
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 2' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LC26GA3X, LC26GA4X, LC32GA4X, LC37GA4X

Only 4 inputs are available, but they can be moved by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 2B hex.

(This group has DVI-A as "Input 5" of the panel).

Input1/Computer1	Computer1	'IAVD 5 + 0D	Computer1 DVI-A
Input2/Computer2	Computer2	'IAVD 3' + 0D	Computer2 Component / S-Video / Video
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 2' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LC45G1X, LC65G5XOM, TU45GAX, TU65GAX, LC32G1X, TU32GAX, LC37G1X, TU32GAX, LC32G2X, TU32GAX, LC37G2X, TU37GAX.

If other input arrangements are needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 2C hex.

(This group has DVI as "Input 5 of the panel, HDMI as "Input 4").

Input1/Computer1	Computer1	'IAVD 5' + 0D	Computer1 DVI
Input2/Computer2	Computer2	'IAVD 4' + 0D	Computer2 HDMI
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 3' + 0D	Video2 Component / S-Video / Video / HDMI (some)

Panel types for this code: LC37GB5U, LC57D90U, LC65D90U, LC26D7U, LC32D7U, LC37D7U, LC26D5U, LC32D5U, LC37D5U, LC26GD6U, LC32GD6U, LC37GD6U, LC45GD6U, LC45GD5U, LC26GD4U, LC32GD4U, LC37GD4U, LC45GD4U, LC26GA5U, LC32GA5U, LC32G4U, LC37G4U, LC37D90U, LC32D50U.

If other HDMI, component, etc is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 2D hex.

(This group has a DVI as "Input 6" of the panel, and HDMI as "Input 4" and "Input 5" of the panel).

Input1/Computer1	Computer1	'IAVD 6' + 0D	Computer1 DVI
Input2/Computer2	Computer2	'IAVD 5' + 0D	Computer2 HDMI
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 2' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LC42GD7X, LC46GD7X, LC52GD7X, LC42GD7U, LC46GD7U, LC52GD7U, LC46G7X.

If other HDMI, component, etc is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 2E hex.

(This group has a DVI as "Input 7" of the panel, and HDMI as "Input 4", "Input 5" and "Input 6" of the panel).

Input1/Computer1	Computer1	'IAVD 7' + 0D	Computer1 DVI
Input2/Computer2	Computer2	'IAVD 6' + 0D	Computer2 HDMI
Input3/Video1	Video1	'IAVD 1' + 0D	Video1 Component / Video
Input4/Video2	Video2	'IAVD 2' + 0D	Video2 Component / S-Video / Video

Panel types for this code: LB1085, LC46D92U, LC52D92U, LC65D93U

If other HDMI, component, etc is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD display/TV, IAVD family (2012 LE series) (Codes 34 to 36 hex)

The Sharp LCD TV family use a wide range of allocations for channels, so we have coded them in many groups with the first four "Inputs" (Computer 1 & 2, Video 1 & 2) customised, and shown below against the particular selection codes.

Special note: Sharp 2012-LE series panels are now shipped with the RS232 interface disabled as a stand-by power saving measure. There is NO menu item to turn it on … it can only be enabled by a special secret command sequence obtainable from Sharp directly after a waiver is signed and sent back to Sharp. This sets "Hotel" mode.

Generic strings provide all options on all panels using all commands "IAVD1 <CR>" through "IAVD9 <CR>" (Note differences with 20-2E setting above with command location of spaces, removing spaces between the IAVD and the digit and padding them in after the digit.)

Generic Channel codes are:

```
Input5          := 'IAVD1   ' + 0D;      //  Generic 1
Input6          := 'IAVD2   ' + 0D;      //  Generic 2
Input7          := 'IAVD3   ' + 0D;      //  Generic 3
Input8          := 'IAVD4   ' + 0D;      //  Generic 4
Input9          := 'IAVD5   ' + 0D;      //  Generic 5
Input10         := 'IAVD6   ' + 0D;      //  Generic 6
Input11         := 'IAVD7   ' + 0D;      //  Generic 7
Input12         := 'IAVD8   ' + 0D;      //  Generic 8
Input13         := 'IAVD9   ' + 0D;      //  Generic 9

TV              := 'IDTV    ' + 0D;      //  TV Digital  only TV option supported

TVChannelUp     := 'DTUP    ' + 0D;      //  Digital Up
TVChannelDown := 'DTDW    ' + 0D;        //  Digital Down
```

Specific strings allocating "IADV" codes customised Computer 1 & 2, Video 1 & 2 strings, listed by selection code.

Sharp LCD panel: Code 34 hex.

Input1/Computer1	Computer1*	'IAVD7 ' + 0D	Computer1: VGA DB-15
Input2/Computer2	Computer2*	'IAVD1 ' + 0D	Computer2: HDMI 1
Input3/Video1	Video1**	'IAVD4 ' + 0D (OPT6 off) or 'IAVD3 ' + 0D (OPT6 On)	Video1: Composite video (OPT6 Off) or HDMI 3 (OPT6 On)
Input4/Video2	Video2**	'IAVD2 ' + 0D	Video2: HDMI 2

***** Swap Computer1 and Computer2 with OPT5 switch, ** Swap Video1 and Video2 with OPT1 switch

Panel types for this code: LC-40LE530X, LC-46LE530X, LC-60LE630X, LC-40LE700X

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 35 hex.

Input1/Computer1	Computer1*	'IAVD8 ' + 0D	Computer1: VGA DB-15
Input2/Computer2	Computer2*	'IAVD1 ' + 0D	Computer2: HDMI 1
Input3/Video1	Video1**	'IAVD6 ' + 0D (OPT6 off) or 'IAVD3 ' + 0D (OPT6 On)	Video1: Composite video (OPT6 Off) or HDMI 3 (OPT6 On)
Input4/Video2	Video2**	'IAVD2 ' + 0D	Video2: HDMI 2

* Swap Computer1 and Computer2 with OPT5 switch, ** Swap Video1 and Video2 with OPT1 switch

Panel types for this code: LC-60LE632U, LC-70LE632U, LC-70LE732U

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel: Code 36hex.

Input1/Computer1	Computer1*	'IAVD8 ' + 0D	Computer1: VGA DB-15
Input2/Computer2	Computer2*	'IAVD4 ' + 0D	Computer2: HDMI 1
Input3/Video1	Video1**	'IAVD1 ' + 0D (OPT6 off) or 'IAVD6 ' + 0D (OPT6 On)	Video1: Composite video (OPT6 Off) or HDMI 3 (OPT6 On)
Input4/Video2	Video2**	'IAVD5 ' + 0D	Video2: HDMI 2

* Swap Computer1 and Computer2 with OPT5 switch, ** Swap Video1 and Video2 with OPT1 switch

Panel types for this code: LC-70LE735X, LC-40LE830X, LC-46LE830X, LC-52LE830X, LC-60LE632X, LC-40LE835X, LC46LE835X, LC-52LE835X, LC-60LE835X

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD panel(Vol 0-100): Code 37hex.

Input1/Computer1	Computer1*	'IAVD8 ' + 0D	Computer1: VGA DB-15 (May be IAVD7)
Input2/Computer2	Computer2*	'IAVD2 ' + 0D	Computer2: HDMI 2
Input3/Video1	Video1**	'IAVD6 ' + 0D (OPT6 off) or 'IAVD3 ' + 0D (OPT6 On)	Video1: Composite video (OPT6 Off) or HDMI 3 (OPT6 On)
Input4/Video2	Video2**	'IAVD1 ' + 0D	HDMI1 with AUDIO RETURN CHANNEL

* Swap Computer1 and Computer2 with OPT5 switch, ** Swap Video1 and Video2 with OPT1 switch

Audio range was changed to 0->100 for this group.

Panel types for this code: LC-60LE650x, LC-70LE650x, LC-80LE633U, LC-70/60/52LE640U, LC-70/60/52C6400U

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'IAVD' codes against physical inputs.

Sharp LCD display (no TV), LCM3700, Mitsubishi LDT651L, INPS family (Codes 30 to 31 hex)

The Sharp LCD TV family use a wide range of allocations for channels, so we have coded them in many groups with the first four "Inputs" (Computer 1 & 2, Video 1 & 2) customised, and shown below against the particular selection codes.

Generic strings provide all options on all panels using all commands "INPS 1<CR>" through "INPS 10<CR>"

Generic Channel codes are:

```
Input5   := 'INPS   1' + 0D;        // Generic 1
Input6   := 'INPS   2' + 0D         // Generic 2
Input7   := 'INPS   3' + 0D;        // Generic 3
Input8   := 'INPS   4' + 0D;        // Generic 4
Input9   := 'INPS   5' + 0D         // Generic 5
Input10  := 'INPS   6' + 0D;        // Generic 6
Input11  := 'INPS   7' + 0D;        // Generic 7
Input12  := 'INPS   8' + 0D;        // Generic 8
Input13  := 'INPS   9' + 0D;        // Generic 9
Input14  := 'INPS  10' + 0D;        // Generic 10
```

Specific strings allocating "INPS" codes customised Computer 1 & 2, Video 1 & 2 strings, listed by selection code.

Sharp LCD panel LCM3700: Code 30 hex.

Input1/Computer1	Computer1	'INPS 6' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'INPS 7' + 0D	Computer2 VDI
Input3/Video1	Video1	'INPS 1' + 0D	Video1 BNC RGB
Input4/Video2	Video2	'INPS 2' + 0D	Video2 S-Video

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'INPS' codes against physical inputs.

Mitsubishi panel LDT651L, LDT521V with Sharp LCD codes: Code 31 hex.

Input1/Computer1	Computer1	'INPS 2' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'INPS 1' + 0D	Computer2 VDI
Input3/Video1	Video1	'INPS 4' + 0D	Video1 Composite Video
Input4/Video2	Video2	'INPS 9' + 0D	Video2 S-Video

If other HDMI, component, etc. is needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'INPS' codes against physical inputs. (Watch that you don't try and use inputs which used shared sockets, eg DVI-D, BNC and HDMI.)

Mitsubishi panel LDT651P with Sharp LCD codes: Code 32 hex.

Input1/Computer1	Computer1	'INPS 2' + 0D	Computer1 DB15
Input2/Computer2	Computer2	'INPS 1' + 0D	Computer2 VDI
Input3/Video1	Video1	'INPS 4' + 0D	Video1 Composite Video
Input4/Video2	Video2	'INPS 3' + 0D	Video2 Component on BNC

If other channels are needed for any of these, it is available by setting constants E0 … E3 with selections from the generic table above. In the back of each panel's User's Manual are allocations of 'INPS' codes against physical inputs. (Watch that you don't try and use inputs which used shared sockets, e.g. DVI-D and BNC.)

This panel can be used with a number of keyboards:

- With a "Code 9" with buttons selecting "Video" and 'Computer;
- With a "Code B-L" or "Code B-P" keyboard, with buttons selecting "Video" and "Computer1" and "Computer2" with Volume control keys; or
- With a "Code E" keyboard, with buttons selecting "TV", "Video" and "Computer", with TV channel Up/Down and Volume control keys. The channel commands send absolute channel commands, so the upper and lower limits must be programmed into Constant:A and Constant:B. (Default is 0 -> 10.)

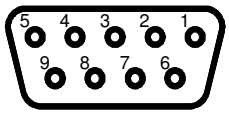
(Keyboards B and E combine channel keys with "On" keys.)

- OPT7 handshake mode not available (yet). Power on panel connection blink codes available.

RS232 connections to Sharp/Mitsubishi (Sharp codes) LCD

These use a 9-pin-D9 (not sure of connector sex). Communications is at 9600 baud 8N1.

Function/Direction	**T440 "projector" Connection**	**Sanyo "Control" Port Connector**
Ground	Ground	9-pin D-sub pin 5
Data from T440 to projector	Tx	9-pin D-sub pin 3 (RXD)
Reply data from projector to T440	Rx	9-pin D-sub pin 2 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C



D-sub 9 male solder side

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Sharp LCD panel: via LAN **Code 3A hex**

PN60/70TA/B3, via LAN RS232 to LAN adaptor

This driver communicates through an xDirect RS232 to LAN "dongle" to the panel using TCP communications.

The Sharp manual is at: http://support.sharp.net.au/downloads/opmanuals/PN70TB3-60TB3_manual_English.pdf

Input1	Computer1	'INPS 2' + 0D;	Computer1 DSUB1(RGB)
Input2	Computer2	'INPS 13' + 0D;	Computer2 HDMI2(PC)
Input3	Video1	'INPS 9' + 0D;	Video1 HDMI1(AV)
Input4	Video2	'INPS 17' + 0D;	Video2 HDMI3(AV)
Input5		'INPS 3' + 0D;	DSUB1(Component)
Input6		'INPS 4' + 0D;	DSUB1(Video)
Input7		'INPS 16' + 0D;	DSUB2(RGB)
Input8		'INPS 10' + 0D;	HDMI1(PC)
Input9		'INPS 12' + 0D;	HDMI2(AV)
Input10		'INPS 18' + 0D;	HDMI3(PC)
Input11		'INPS 14' + 0D;	Disp.Port

Mute is supported but not freeze. Volume goes 0->31.

See JED document:
http://www.jedmicro.com.au/PDF_Docs/Setting%20Up%20LAN%20control%20with%20JED%20controllers%20.pdf

This discusses in detail the setup to the Sharp screen, the xDirect interface, the T460 setup and connections between them.

The HDMI channels seem to have to be setup for PC or AV use. If a channel is commanded to an HDMI-PC the HDMIx PC message appears top right on the screen,(x is HDMI number), even if no signal is present, but if an HDMI-AV channel is selected, the corresponding ID message does NOT appear, even though the panel does switch to it. Weird!

Reply mode is available and works via the PLAN interface, polling the panel every 5 seconds, and closing down the T460R if, for instance, the panel is turned off by the IR remote.

(Warmup does take about 30 seconds, even if a picture does appear after only 5 seconds. The panel has a long startup sequence of some sort of about 25 seconds, sending out "wait" messages every 5 seconds during this time. Don't attempt to shorten this.)

Smart LCD flat panel 8055i (Code 70 hex), 8070i (Code 71 hex)

RS232 manual is at:
http://downloads01.smarttech.com/media/sitecore/en/support/product/sbfpd/8000series/guides/rs232configsbid8070iv22apr2011.pdf and

http://downloads01.smarttech.com/media/sitecore/en/support/product/sbfpd/8055i/guides/roomcontrolsbid8055iv06june12.pdf

Channel codes are:

```
Code 70:  Input1     :=  'set input=VGA1' + 0D;    //Computer 1:Input 1: RGB Digital DB15
Code 70:  Input2     :=  'set input=VGA2' + 0D;    //Computer 2: overwrite

Code 71:  Input1     :=  'set input=VGA' + 0D      //Computer 1: Input 1: RGB Digital DB15
Code 71:  Input2     :=  'set input=RGB/HV' + 0D;//Computer 2: Input 2: RGB Digital

Input3     :=  'set input=Video1' + 0D;     //Video 1  * (OPT1 swaps Video1 & Video2)
Input4     := 'set input=HDMI1' + 0D;       //Video 2   HDMI * (OPT1 swaps Video1 & Video2)

 * T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

 * Input4    := 'set input=S-Video' + 0D;    //  S-video V062

Input5     :=  'set input=DVI' + 0D
Input6     :=  'set input=Video2' + 0D;
Input7     :=  'set input=S-Video' + 0D;

Input8     :=  'set input=DVD/HD1' + 0D;
Input9     :=  'set input=DVD/HD2' + 0D;

Input10    :=  'set input=HDMI2' + 0D;
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

This panel can be used with a number of keyboards:

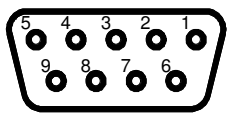
- With a "Code 9" or "Code 8 or A" keyboards, with buttons selecting "Video" and 'Computer", with either "Volume" (code 9) or "Freeze/Mute" (Code A);
- With a "Code B-L" or "Code B-P" keyboard, with buttons selecting "Video" and "Computer1" and "Computer2" with Volume control keys;

  (Keyboards B and E combine channel keys with "On" keys.)
- OPT7 handshake mode and power on panel connection blink codes available.

RS232 connections to Smart LCD

These use a 9-pin-D9 male on the projector, male on cable. Communications is at 9600 baud 8N1.

Function/Direction	**T440 "projector" Connection**	**Smart "Control" Port Connector**
Ground	Ground	9-pin D-sub pin 5
Data from T440 to projector	Tx	9-pin D-sub pin 3 (RXD)
Reply data from projector to T440	Rx	9-pin D-sub pin 2 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C



D-sub 9 male solder side

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Sony LCD (Codes 18 to 1B, 40 hex)

This family has many members with a range of channel messages.

RS232 codes are usually in a Sony Protocol Manual and can be found by searching in Google for a PDF file with the LCD model number.

A number of models are covered which share a large number of inputs but we have set up 4 drivers which use selected inputs for Computer 1 & 2 and Video 1 & 2. If any other are needed for these four channels, set input numbers from the common table below into constants E0 to E3.

The 40 hex driver works via an RS232 to HDMI interface box, which allows a commercial panel (without RS232) to work via an RS232 control system.

Channel codes are:

Code 18: Sony LCD FWD-32/40LX1_R, FWD-50PX2 Group 1

```
Input1   := 8C + 00 + 01 + 02 + 0A + 99;   //Computer 1: Input 2: RGB Digital DB15
Input2   := 8C + 00 + 01 + 02 + 20 + AF;   //Computer 2: Input 1: DVI

Input3   := 8C + 00 + 01 + 02 + 0C + 9B;   //Video 1: Option 1: Video
Input4   := 8C + 00 + 01 + 02 + 0D + 9C;   //Video 2: Option 1: S-Video
```

Code19: Sony LCD FDW-32LX2F, FDW-40LX2F, FDW-32LX2X, FDW-40LX2X, KLH-W26, KLH-W32 Group 2

```
Input1   := 8C + 00 + 01 + 02 + 08 + 97;   //Computer 1: Input 1: RGB Digital DB15
Input2   := 8C + 00 + 01 + 02 + 44 + D3;   //Computer 2: Input 2: HDMI RGB Digital

Input3   := 8C + 00 + 01 + 02 + 10 + 9F;   //Video 1: Option 2: Video
Input4   := 8C + 00 + 01 + 02 + 11 + A0;   //Video 2: Option 2: S-Video
```

Code 1A: Sony LCD FWD-42PV1-A/P and 42V1, 42X1, 50PX1 Group 3

```
Input1   := 8C + 00 + 01 + 02 + 0A + 99;   //Computer 1: Input 2: RGB Digital DB15
Input2   := 8C + 00 + 01 + 02 + 20 + AF;   //Computer 2: Input 1: DVI

Input3   := 8C + 00 + 01 + 02 + 10 + 9F;   //Video 1: Option 1: Video
Input4   := 8C + 00 + 01 + 02 + 11 + A0;   //Video 2: Option 1: S-Video
```

Code 1B: Sony LCD FWD-S42/47H1, FWD-S42E1 Group 4 GXD-L52/65H1 Group 5

```
Input1   := 8C + 00 + 01 + 02 + 08 + 97;   //Computer 1: Input 1: RGB Digital DB15
Input2   := 8C + 00 + 01 + 02 + 20 + AF;   //Computer 2: Input 1: DVI

Input3   := 8C + 00 + 01 + 02 + 30 + BF;   //Video 1: Video
Input4   := 8C + 00 + 01 + 02 + 31 + C0;   //Video 2: S-Video
```

Following are alternate input strings … see the individual model RS232 protocol documents to choose appropriate ones:

```
Input5   := 8C + 00 + 01 + 02 + 30 + BF;   //Video, Group 4, Group 5
Input6   := 8C + 00 + 01 + 02 + 31 + C0;   //S-Video, Group 4, Group 5

Input7   := 8C + 00 + 01 + 02 + 20 + AF;   //Input 1: DVI Group 1, Group 3, Group 4, Group 5

Input8   := 8C + 00 + 01 + 02 + 08 + 97;   //Input 1: RGB Digital DB15 Group 2, Group 4, Group 5
Input9   := 8C + 00 + 01 + 02 + 09 + 98;   //Input 1: YUV (Component) DB15 Group 2, Group 4, Group 5

Input10  := 8C + 00 + 01 + 02 + 0A + 99;   //Input 2: RGB Digital DB15 Group 1, Group 3
Input11  := 8C + 00 + 01 + 02 + 0B + 9A;   //Input 2: YUV (Component) DB15 Group 1, Group 3

Input12  := 8C + 00 + 01 + 02 + 0C + 9B;   //Option 1: Video Group 1, Group 2
Input13  := 8C + 00 + 01 + 02 + 0D + 9C;   //Option 1: S-Video Group 1, Group 2
Input14  := 8C + 00 + 01 + 02 + 0E + 9D;   //Option 1: RGB Group 1, Group 2, Group 4
Input15  := 8C + 00 + 01 + 02 + 0F + 9E;   //Option 1: Component Group1, Group 2, Group 4

Input16  := 8C + 00 + 01 + 02 + 10 + 9F;   //Option 2: Video Group 1, Group 2, Group 3
Input17  := 8C + 00 + 01 + 02 + 11 + A0;   //Option 2: S-Video Group 1, Group 2, Group 3
Input18  := 8C + 00 + 01 + 02 + 12 + A1;   //Option 2: RGB Group 1, Group 2, Group 3
Input19  := 8C + 00 + 01 + 02 + 13 + A2;   //Option 2: Component Group 1, Group 2, Group 3
```

```
Input20  := 8C + 00 + 01 + 02 + 44 + D3;    //Input 2: HDMI RGB Digital Group 2
Input21  := 8C + 00 + 01 + 02 + 45 + D4;    //Input 2: HDMI RGB Digital Group 2

Input22  := 8C + 00 + 01 + 02 + 54 + E3;    //Input 3: HDMI RGB Digital Group 2
Input23  := 8C + 00 + 01 + 02 + 55 + E4;    //Input 4: HDMI RGB Digital Group 2

Input24  := 8C + 00 + 01 + 02 + 84 + 13;    //Option: HDMI 1, Group 4, Group 5
Input25  := 8C + 00 + 01 + 02 + 85 + 14;    //Option: HDMI 2, Group 4, Group 5
```

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

This panel can be used with a number of keyboards:

- With a "Code 9" keyboard, with buttons selecting "Video" and 'Computer", with "Volume" keys;
- With a "Code B-L" or "Code B-P" keyboard, with buttons selecting "Video" and "Computer1" and "Computer2" with "Volume" control keys. (Keyboards combine channel keys with "On" keys);
- (There is no point in using a Code 8 or A keyboard, as there is no "Freeze" function;

Panel connection blink codes are available but OPT7 handshake mode in NOT;

Audio mute with 2 Vol keys is available, but not video mute.

Code 1D: Sony LCD KDL-nnEX500, KDL-nnHX909, KDL-nnXBRx (PRO models only)

RS232 codes are in a Sony Protocol Manual which in only available from Sony by signing a non-disclosure agreement. So below we have only shown the channel selection bytes, not the whole message, to preserve their secrecy.

(However, the Rev 4 of the manual is actually available on Sony's **own** site: by simply Googling "set standby command as enable")

The panel will not normally startup when sent a Power Up command unless it has previously received a "Standby Command Enable" string. (There is no way of using a panel menu command to set this up manually.) This driver does send a command "Standby Command Enable" just before the Power Down string, so that the panel is then enabled for RS232 commands startup.

So the setup sequence to allow RS232 controlled starts is:

1. Turn panel on manually;
2. Turn T430/T440 on with ON button;
3. Check commands all work, then turn OFF the system using the T430/T440 OFF button (this also sends the "Standby Command Enable");
4. Now turn on the panel with the T430/T440 ON button … it should now be fully remote-controllable via RS232.

A number of models are covered which share a large number of inputs but we have set up one driver which uses selected inputs for Computer 1 & 2 and Video 1 & 2. If any other are needed for these four channels, set input numbers from the common table below into constants E0 to E3.

Channel codes are:

```
Input1      := xxx + 05 + 01 + CKS   //Computer 1: Input 1: RGB  DB15
Input2      := xxx + 04 + 01 + CKS   //Computer 2: Input 2: HDMI 1

Input3      := xxx + 02 + 01 + CKS   //Video 1
Input4      := xxx + 02 + 02 + CKS   //Video 2 *
```

* Setting T440: OPT6 switch ON will use S-Video in place of HDMI. T430: uses HDMI as Video2.

```
Input5      := xxx + 02 + 03 + CKS   // Video 3

Input6      := xxx + 03 + 01 + CKS   // Component 1
Input7      := xxx + 03 + 02 + CKS   // Component 2
Input8      := xxx + 03 + 03 + CKS   // Component 3
```

```
Input9      := xxx + 04 + 01 + CKS   // HDMI 1
Input10     := xxx + 04 + 02 + CKS   // HDMI 2
Input11     := xxx + 04 + 03 + CKS   // HDMI 3
Input12     := xxx + 04 + 04 + CKS   // HDMI 4
Input13     := xxx + 04 + 05 + CKS   // HDMI 5

Input14     := xxx + 06 + 01 + CKS   // Digital media

TV          := xxx + 02 + 01 + CKS   // Dig TV
```

TV channel up/down is supported with the blue keys on a Code:E keyboard.

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making S-Video the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

This panel can be used with a number of keyboards:

- With a "Code 9" keyboard, with buttons selecting "Video" and "Computer", with "Volume" keys;
- With a "Code B-L" or "Code B-P" keyboard, with buttons selecting "Video" and "Computer1" and "Computer2" with "Volume" control keys. (Keyboards combine channel keys with "On" keys);
- (There is no point in using a Code 8 or A keyboard, as there is no "Freeze" function;
- Aspect ratio roll is provided by setting UserFlags (see part A manual);
- Panel connection blink codes are available but OPT7 handshake mode in NOT;
- Audio mute with 2 Vol keys is available, but not video mute.

Code 40: Sony BRAVIA LCD-TVs KDL-HX92x/82x/72x, NX72x, EX72x/62x/52x/46x/42x/32x, CX52x/400

These are commercial panels which, while they don't have RS232 ports, do allow RS232 control via an interface box feeding commands into the HDMI **C**onsumer **E**lectronics **C**ontrol system. The interface boxes from Sony are called CBX-H10/1 and CBX-H11/1 and have their own power supply.

Channel codes are:

```
Input1      := 8C + 00 + 02 + 03 + 05 + 01 + 97  //Computer 1: PC Digital DB15
Input2      := 8C + 00 + 02 + 03 + 04 + 02 + 97  //Computer 2: HDM2

Input3      := 8C + 00 + 02 + 03 + 02 + 01 + 94  //Video 1: Video1
Input4      := 8C + 00 + 02 + 03 + 04 + 01 + 96  //Video 2: HDMI 1

Input5      := 8C + 00 + 02 + 03 + 03 + 01 + 95  // Video 2 Component

Input6      := 8C + 00 + 02 + 03 + 04 + 03 + 98  // HDMI 3
Input7      := 8C + 00 + 02 + 03 + 04 + 04 + 99  // HDMI 4

TV          := 8C + 00 + 02 + 02 + 01 + 91       // DTV
```

TV channel up/down is supported with the blue keys on a Code:E keyboard.

Any one of these codes can be set into Constant:0/Constant:1 for computer codes and Constant:2/Constant:3 for video codes. (The default is to have Computer1 (above) as the "Computer" channel and Video1 as the "Video" channel. Setting OPT1 switch ON will swap Video1 and Video2 channels, making HDMI 1 the video default. Setting OPT5 switch ON will swap Computer 1 and Computer 2 sources.)

This panel can be used with a number of keyboards:

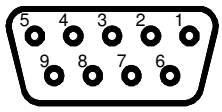
- With a "Code 9" keyboard, with buttons selecting "Video" and "Computer", with "Volume" keys;
- With a "Code B-L" or "Code B-P" keyboard, with buttons selecting "Video" and "Computer1" and "Computer2" with "Volume" control keys. (Keyboards combine channel keys with "On" keys);
- (There is no point in using a Code 8 or A keyboard, as there is no "Freeze" function;
- Aspect ratio roll is provided by setting UserFlags (see part A manual);
- Panel connection blink codes and OPT7 handshake are available;

- Audio/video mute with 2 Vol keys is available.
- As of V107, the ON command is sent twice to turn on latest panels with deep sleep mode, and warm-up time has been increased to 22 seconds to allow panel boot up. Sony advise: For **all** RS232 commands to function on the Android TV models the set must be upgraded to the latest available software which is currently pkg2.465, available to download from sony.com.au /support, or an auto update can be done if the TV is connected to the WWW. One difference is that if the TV has been off for more than 15 minutes it will then be in deep standby which will require the ON command to be sent twice.

RS232 connections to Sony LCD flat panels

These all use a D-sub 9-pin connector, male on cable.

LCD panels, 9600 BAUD, No parity, 1 stop.

Function/Direction	**T440 "projector" Connection**	**Projector Connector (Male on cable)**	 D-sub 9 male solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T440 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T440	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T440, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

2-Touch / CTOUCH LCD touch panel (Codes 9D hex).

These are an LG-style panel with touchscreen add-on on the front, in sizes of 46", 55", 65", 70", 82" and 84".

Protocol document is at:

http://www.c-tools.nl/Files/Producten/CTOUCH/CTOUCH%20RS232C_Protocol_MODEL%20B%2046_55_65_70_82_3%20HDMI.pdf

Channel codes are:

```
Input1   := 'kb 00 07' + 0D;        // Computer1 VGA DB15
Input2   := 'kb 00 0a' + 0D;        // Computer2 HDMI 2

Input3   := 'kb 00 02' + 0D;        // Video 1 A/V                 * (OPT1 swaps Video1 & Video2)
Input4   := 'kb 00 09' + 0D;        // Video 2 HDMI 1 default * (OPT1 swaps Video1 & Video2)
```

* T440: OPT6 switch ON will use S-Video in place of HDMI2. T430: uses HDMI2 as Video2.

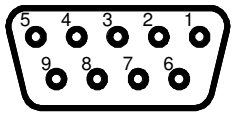
```
Input4   := 'kb 00 03' + 0D;        // Video 2 S-Video

Input5   := 'kb 00 04' + 0D;        // Component

Input6   := 'kb 00 0b' + 0D;        // HDMI 3

TV       := 'kb 00 00' + 0D;        // DTV
```

RS232 connections to 2-Touch / CTOUCH LCD projectors:

D-SUB 9 Female on panel, male on cable. Comms at 9600 8N1.

Note: Connector wiring on 2-Touch and CTOUCH documentation is totally incorrect, (e.g. Gnd on pin 1, links on 8->9) Following has been tested and works correctly. Don't link pins 8 & 9.

Function/Direction	**T460 "projector" Connection**	**Panasonic Serial Port Connector**
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C



D-sub 9 male solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.